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CASE OF OCCLUSION OF VAGINA, WITH OPERATION, AND DEATH FROM SHOCK AND PERITONITIS. ABSENCE OF VAGINA, AND MALFORMATION OF UTERUS.

[Read before the Boston Society for Medical Improvement, Sept. 12th, 1864, and communicated for the Boston Medical and Surgical Journal.]

By David W. Cheever, M.D., of Boston.

Sept. 5th, 1864.—M. M., aged 22; single; born in Boston. Four years ago, was operated on to relieve suppressed catamenia. Symptoms then were swelling over the lower portion of the bowels, pain in the region of the uterus, extending down the thighs and back. Three weeks after the first operation, she was again operated on, on account of non-success of the first one, when, according to her account, the catamenia appeared and continued for three weeks. Never menstruated before or since, but says that a menstrual molimen has always been present since 14 years of age, when, at regular periods, there was pain and swelling over the hypogastrium, backache, and the usual phenomena of menstruation, without any discharge. Otherwise healthy. The patient expressed herself as miserable on account of this infirmity, having no wish to live as she then was, and desirous of submitting to anything for relief.

Sept. 6th.—The rectum having been thoroughly emptied by an enema of soap suds and aloes, she was etherized, and placed across a bed with the hips elevated and thighs flexed. On separating the labia, it was found that the vagina was of normal diameter, but terminated in a *cul de sac* about an inch and a half deep. Across the bottom was a transverse linear cicatrix, marking the site of former operations. The catheter passed freely into the bladder, and could be felt by the finger in the rectum. There seemed to be only a moderately thick septum, or wall, between these two organs. High up through the rectum could be felt a small, round, hard projection, which presented to the finger the normal sensation of the os uteri covered by the bowel.

It was evident that a cautious dissection might open a passage between the bladder and rectum up to this point. Although the risk seemed considerable, yet influenced by the account of former operations on this patient, in which it was claimed that the uterus had been reached and menstruation had taken place, although the bladder had been wounded, without, however, serious consequences, it was decided to attempt the operation. By a slow dissection, at first with the knife through the cicatrix, and afterwards with the finger in the cellular tissue, guided by the catheter in the bladder, and finger of the other hand in the rectum, a depth of two inches from the bottom of the *cul de sac* was reached without wounding either bladder or rectum. No true vagina could be found, and no protrusion resembling a sac of retained menses. Yet just beyond the finger could now be plainly felt the supposed os uteri, covered by a thin membrane. A passage having been made thus far with safety, it was thought feasible to complete it. An assistant, with the hand over the abdomen above the pubes, pressed this projection of hard tissue firmly down into the pelvis, while the membrane covering it was cautiously incised with the knife. The finger dilating this opening failed to find any os, or body of the uterus, but passing behind a small, smooth, rounded protuberance, which corresponded to the cervix, entered a free cavity and distinguished two oval, hard bodies, supposed to be ovaries, but afterwards found to be the two separated cornua of a malformed uterus.

It being but too plain that the cavity of the peritoneum had been opened, of course all other attempts were desisted from. The patient was placed in an easy posture, the urine drawn off, and two grains of opium given. When seen, four hours after the operation, she had the collapsed appearance of severe constitutional shock. Chills, followed by fever, pain, and swelling of the bowels, came on early next day. Leeches over the hypogastrium, fomentations, opium, diluents, beef-tea, &c., were given, and the catheter used frequently. She sank into a comatose state, and died on the 10th, four days after the operation.

Autopsy, 22 hours after death.—Body well developed. Breasts full. Nipples large and projecting. Areolæ rather dark, and studded with enlarged follicles, like those of pregnancy. External organs of generation perfect. A limited amount of injection and inflammation of the greater omentum; more of the peritoneum around the pelvic organs. Pus and serum at bottom of pelvis. A hole, which would admit the finger, leading from the vagina into the pelvic cavity, and between the rudiments of the uterus and the rectum. A small opening ulcerated through the left broad ligament. Bladder inflamed, and spotted internally with lymph. Rectum not inflamed. Neither bladder nor rectum wounded. Where the body of the uterus should have been, there was nothing. A nodule of fibrous uterine tissue, as big as a small hickory nut, in the situation of the os uteri.

No opening of the os could be found. On either side, but over an inch distant from the central portion, and connected apparently by a rounded fibrous cord, were two segments of the fundus of the uterus, oval in shape, and rather larger than the part corresponding to the cervix. No cavity could be found in either of these segments. Opening from the central one were two small foramina, which ran out into the broad ligament, and seemed like uterine sinuses. Ovaries and Fallopian tubes normal, but the former larger than usual. Appearances in the ovary like corpora lutea. No opening of Fallopian tubes from the lateral cornua of the malformed uterus could be found. The round ligaments were normal.*

CASES OF OVARIOTOMY.

BY G. KIMBALL, M.D., OF LOWELL, MASS.

[Communicated for the Boston Medical and Surgical Journal.—Continued from p. 11.]

CASE VIII.—Miss M., of Canaan, N. H., a naturally healthy and vigorous young lady, 18 years of age, came to Lowell the latter part of February last, to consult me in regard to an ovarian tumor, the existence of which she had discovered only about four months before. The increased size of the abdomen had always been perfectly uniform, consequently she was unable to state on which side the disease had originated; nor had there been any suffering other than the peculiar distress arising from great distension, and a difficulty of breathing, especially when in a recumbent position. She had taken a great variety as well as large quantities of medicine, none of them affording any relief, but, on the contrary, proving even worse than useless. She had now made up her mind, if the case should be judged favorable, to be relieved of her malady by an operation, and upon the expediency of this measure I was called upon to give my opinion. A careful consideration, therefore, of the circumstances of the case—to wit, the apparently favorable character of the tumor, the existing and daily increasing personal discomfort, and especially the manifest beginning of an encroachment of the disease upon the general health—induced me to say that I believed an operation justifiable.

Encouraged by this statement, the operation was at once decided upon, and accordingly carried into effect on the 24th of February.

Details of the various steps of the operation are not necessary; they were in no essential particular different from those in the foregoing cases where the tumor consisted of a single cyst without adhesions. Upon returning to consciousness, however, from the effects of ether, the patient complained of severe pain through the back and hips—a circumstance not at all unusual, and therefore causing, at first, no special anxiety; its persistence, however, and its increased intensity, led to the suspicion that the source of suffering might be the same as had been observed in a previous case, viz., an undue tension upon the pedicle, incident to the use of the clamp. The removal of this instrument, therefore, and allowing the pedicle (first embraced in a ligature) to fall back a certain distance between the lips of the wound, was followed by immediate relief. There was subsequently an occasional recurrence of this same kind of suffering, but it was always controlled readily and effectually by an enema containing from 40 to 50 drops of laudanum. In addition to the difficulties just named, there came on, also, a severe attack of diarrhœa, and almost simultaneously with it, a diphtheritic sore throat—a complication of troubles that for a time threatened to be more than the patient would be able to withstand. Both the diarrhœa and sore throat, however, were gradually brought under control, and in a fortnight after the operation the patient was apparently not only out of danger, but really making rapid progress towards complete recovery.

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* Similar, but not identical malformations are described by Rokitansky, vol. ii., p. 272, on Bi-partite Uterus."

From the beginning to the end of the case, everything relating directly to the operation itself went on in a most satisfactory manner, and at the end of five weeks she started for home, a hundred miles distant from Lowell, accomplishing the distance without inconvenience and with but little fatigue.

From a note received from her a short time since, I learn that she is regularly improving in strength, while in every other respect she considers herself well.

DR. GAILLARD'S PRIZE ESSAY ON OZONE; ITS RELATIONS TO HEALTH AND DISEASE.

[Continued from page 136.]

We find still another proof of the fact that ozone is not simply oxygen electrified, in the examination of one of the methods for manufacturing ozone. Ozone can readily be prepared from phosphorus, in the presence of oxygen and water; but dry phosphorus, in dry oxygen, does not produce ozone.* Dr. Griffin adds, that "this is intelligible on the supposition that ozone contains hydrogen; but not otherwise." According to this authority, "Nature sets no limits to the ozonization of oxygen, and does the work without difficulty or loss of time, when she is allowed sufficient hydrogen with which to do the work. When you reverse it, and set nature to make ozone without hydrogen, you resemble the Egyptians who set the children of Israel to make bricks without straw."

Although it is not absolutely *necessary*, in enabling us to investigate the properties of ozone, to learn its actions, to appreciate its presence, and to realize most sensibly the great *rôle* it performs in the drama of Nature, that its chemical composition should be fully determined, yet it is most desirable that there should be, in regard to it, the least possible ambiguity or obscurity. We should, however, profit by the history of the subject up to the present time, and accept what is suggested, only after the most rigid analysis and elaborate test. Above all, we should be slow to avoid all premature conclusions, and the founding, upon such questionable bases, exaggerated theories and ingenious hypotheses. Nothing, than this, can be more truly inimical to the advancement and dignity of any science. The exact chemical composition of ozone must be the subject of still farther examination and controversy; and, for the avoidance of ultimate error, it is best that this should be the case. "Debatable questions, such as these, are worth the attention of the inquiring student. We are accustomed to laugh at the fantastic notions and the false reasonings of the alchemists, but we sometimes ride our modern chemical hobbies as unskilfully as they did the wild hobbies of the middle ages." Hypercredulity is the almost universal characteristic of the students of our present time; it is a most serious enemy to the progress of any science, but, above all, to that science (chemistry) which is founded on the unanswerable logic of fact. It cannot then be said, with absolute certainty, what is the *true and invariable* composition of ozone. *It is clearly proved, however, that the recently accepted doctrine, in regard to ozone, is incorrect; it is not simply and solely electrified oxygen.*

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* Dr. Muller, of the University of Freiburg.

Ozone can frequently be perceived, by its odor, when we are unable to detect the coincident presence of hydrogen. As Dr. Griffin well remarks, in his recent views on this subject, "the difficulty of determining whether ozone is an element, or a compound, depends upon the fact that the quantity of acting matter is so small that it cannot be confined long enough to be weighed, measured and analyzed *with certainty*. Yet the majority of the reactions seem to clearly show, that ozone is not oxygen, but an oxide of hydrogen." Most of those who were the chief endorsers of the theory in regard to electrified oxygen, have abandoned it. Dr. Andrews, who was quoted as authority on this subject, as one who had expended upon it much care and labor, comes before a public society and confesses that "the commonly received statement that the whole of a given volume of dry oxygen gas, contained *alone* in a hermetically sealed glass tube, can be converted into ozone by the passage of electrical sparks, *is erroneous*." It is publicly stated, that the experiments of MM. Frémy and Becquerel, for the elucidation and establishment of this theory, *were only three;* that two failed, and the third "presents numerous reasons for doubt." Dr. Gregory and others, who based their opinions and declarations upon the previously published statements of Dr. Andrews, cannot longer be cited as authorities; Dr.

Griffin ridicules the theory, and regards it as untenable and as "a chemical hobby." M. Schönbein regards the theory as impossible in its nature, and now holds his original opinion on this subject. Dr. Richardson, of London, who has bestowed great care and labor on this subject, and who is now actively engaged in the study of it, thus writes: "I consider, with Schönbein, that peroxide and binoxide of hydrogen and ozone are all the same."—(Autograph letter from Dr. Richardson, January, 1861.) After a careful and long study of this subject and of the writings of all similarly engaged, it is certainly in accordance with the best and most reliable testimony, that ozone should be regarded as a peroxide of hydrogen. *It is certainly safe to say, that the most reliable investigators now regard it as a peroxide of hydrogen.*

It is proper that, in this connection, I should give very briefly the opinions of those who do not consider this the composition of ozone, and of those who hold and advocate views both novel and antagonistic.

Schönbein published, in 1858, an article on the subject of the composition of ozone. In this he states that there are three kinds of oxygen—"Common oxygen, or oxygen in an inactive state; ozone, or oxygen in an active state-positive; and antozone, or oxygen in an active state-negative. When these last two kinds of oxygen combine with each other, equivalent to equivalent, they constitute common inactive oxygen." On this theory, he proposes to establish two classes of metallic oxides; the ozonides and antozonides. He thus enumerates the ozonides; they are the superoxides of Mn, Pb, Ni, Co, Bi, Ag, and also the compounds chromic, permanganic and tanadic acids. The ozonides are said to possess the following properties: "When heated with hydrochloric acid, they produce chlorides, free chlorine and water. They do not combine with hydrated acids. They decompose oxygenated water into water and oxygen. They give a blue color to freshly prepared tincture of guaiacum. They are strongly electro-negative." The antozonides are the superoxides of Ba, Sr, Ca and of the metals of the alkalies. The antozonides have the following properties: "When treated with hydrochloric acid, they produce chlorides and oxygenated water. They do not discharge free chlorine from chlorides. They combine with hydrated acids. They do not decompose oxygenated water into water and oxygen. They do not give a blue color to the freshly prepared tincture of guaiacum; on the contrary, they bleach that which has been made blue by the ozonides. They are electro-positive." Although these two classes are yet retained and styled the ozonides and the antozonides, still M. Schönbein, on the authority of Dr. Richardson, of London (Autograph letter, Jan., 1861), does not now consider ozone as oxygen electrified, but as "a peroxide or binoxide of hydrogen." Dr. Richardson, in his paper read before the Medical Society of London, takes the same view. It will thus be seen that M. Schönbein has, in recent years, advocated novel views in regard to the composition, but that he has returned to his original opinions and theory. Dr. Pickford regards ozone as a teroxide of hydrogen. Dr. Prout styles it a deutoxide of hydrogen. We do not think it necessary to discuss their reasons for these opinions, as they are too entirely based upon hypotheses to be of practical value.

In a paper read by Dr. E. J. Fountain, of Iowa, before the American Medical Association, in June, 1860, and to which he invites the attention and criticism of the profession, there is a marked and prominent allusion to the subject of ozone. He observes: "I shall venture to affirm, that *ozone is simply oxygen in a nascent condition, produced by the electro-lytic decomposition of the vapor of water in the atmosphere.*" In another part of his paper, he states: "My attention has been directed to the subject in connection with recent investigations in relation to oxygen as a therapeutic agent. My observations have led to the development of a theory of the nature of ozone, which I believe to be more in accordance with well-known laws in natural philosophy, *than any heretofore advocated;* and while it embraces, as I believe, all the facts which have been observed, in relation to the subject, it clears up many of the difficulties which have been acknowledged to belong it." It is proper to say, that the author did not italicise the words thus represented in the *last* sentence. These views, from the prominence which has been given to them, by the associated circumstances, should certainly meet with respect and consideration; at the same time, they are a proper subject for criticism. Being incorporated with the published transactions of such a body, they will call forth criticism abroad, if they escape it at home. We propose, therefore, to briefly allude to them, and, with all respect proper, to mention a few facts which would of themselves, perhaps, form the most appropriate criticism.

M. Houzeau, in his writings on this subject, *six or eight years since, advocated the same views.* These views were extensively published, and, since that time, have been well known to all who have made a continuous study of this subject. They were examined and of course well understood, but, with one or two exceptions, failed to secure the attention or public notice which perhaps they deserved. It is needless to say that these views are entirely speculative, and that they were not practically supported by their original advocate. M. Scoutetten, in his work, alludes to them; he observes "that in the decomposition of the binoxide of barium, by sulphuric acid, there is an abundant production of electricity, and, immediately after this, *the formation of ozone;* it is to *this gas* we must attribute *the properties peculiar to nascent oxygen.*" Again, he alludes to the same principle or gas as *really producing* the effects *attributed* to nascent oxygen. Writing of the production of electricity as attending the decomposition of binoxide of barium, he observes: "these things take place in all analogous cases; but when the decomposition of a salt takes place slowly *electricity is developed slowly,* and does not sufficiently react on the oxygen, which thus for a time preserves the properties appertaining to it." In other words, oxygen, in such cases, where the changes (produced by the attending electrical results of decomposition) take place slowly, presents to us the mixed condition of oxygen and ozone; that in this state it is styled nascent oxygen, but that all the properties attributed to this, so-called, nascent oxygen must be attributed to the ozone which enters into its composition. Or, as Scoutetten observes, "*to this gas* (ozone) *we must attribute all the properties peculiar to nascent oxygen.*" With this exception, no author of whom we are aware has given to M. Houzeau's suggestion the complimentary attention of a public or published analysis. It of course received the notice usually bestowed on plausible suggestions and attractive hypotheses. It is fair to claim that the failure to attract any farther attention than this is sufficient, if not *prima facie,* evidence of the speculative and untenable character of any theory. We wish to be understood, in this brief notice, to have exclusive reference to the theory suggested, and in no respect to its American advocate.

Of course, to Dr. Fountain undoubtedly belongs all the credit of an original suggestion, and we are fully satisfied that had he, in his extensive reading, met with the history and review of the theory he advocates, he would have been among the first to appreciate and recognize its fallacy. Enthusiastic, as he appears to be, in the investigation of subjects forming the topics of his published papers, it is evident that he desires to bring to their study close examination and dispassionate reasoning. It will thus be seen that the theory of nascent oxygen forming the composition or active principle of ozone is not new; and, also, that it is not tenable. These form the most interesting views advocated in regard to the composition of ozone. It is now generally regarded as a binoxide, or peroxide of hydrogen. Dr. Müller, of the University of Freiburg, considers ozone to be a compound of oxygen and water.

We have, upon this branch of the subject, given in a few pages the basis, true value and recognized result of volumes of controversy. After again stating that its composition is now generally considered to be a binoxide, or peroxide of hydrogen, we pass on to the consideration of the properties of ozone. Ozone is the most rapid oxidizer known; it is colorless, of suffocating odor, somewhat similar to the admixture of chlorine and atmospheric air. The odor of ozone is too penetrating and suffocating to be inhaled with safety in a state of purity. Its power is such that one part of ozone is perceptible in a million parts of atmospheric air. It is diffusible in oxygen gas or in the atmosphere. "The extent to which oxygen can be saturated with ozone is not accurately known." It is so destructive to life that an atmosphere containing the $\frac{1}{5000}$th part of ozone is fatal. "During the electrolysis of water, which contains $\frac{1}{10}$th of sulphuric acid, Baumert found only one milligramme of ozone in 150 litres of explosive gas. Andrews found that when water was mixed with one eighth of sulphuric acid, the oxygen, separated from the hydrogen, contained four milligrammes of ozone in one litre of gas, and he states that with a solution containing one half sulphuric acid eight milligrammes of ozone may be condensed in one litre of oxygen. This is the highest published estimate, and is equal to one part of ozone in one hundred and eighty parts of pure oxygen."

The odor of ozone is perhaps most like to that emitted by an electric machine, when in rapid motion. The most familiar manifestation of ozone is that peculiar odor detected in the atmosphere after a thunder storm. When in the least concentrated, it is extremely irritating to the respiratory organs. Ozone cannot be separated from oxygen, or reduced to the liquid or solid state. Dr. Griffin states that it is insoluble in water and in solutions of acids and alkalies. All organic matters have their coloring principle speedily destroyed by it; albumen and lignin, also, whether found alone, as with the former, or as in the case of the latter, representing the base of some inorganic body. It possesses the most powerfully bleaching properties known, and rapidly corrodes even cork or caoutchouc. Metallic silver is converted by it into a peroxide of silver. It is easily destroyed by heat, and if made to pass through a tube heated to redness, is entirely destroyed. If ozonized oxygen is thus tried, only oxygen remains. It is a quick and efficient deodorizer, and if a piece of tainted meat is immersed in it for a few moments, all unpleasant odor is speedily removed. Oxygen combines very slowly with mercury, at ordinary temperatures, whilst ozone, if the metal be damp, unites very rapidly with it; most rapidly with mercury and silver, at low temperatures. It decomposes the solution of the iodide of potassium in water, giving to the water a yellow color. There must be a slight dampness for ozone to combine rapidly with most substances. It combines with chlorine, bromine and iodine chemically, and with water, but for this last there must be contact of several hours. When uniting with chlorine, bromine and iodine, there will be found chloric, bromic and iodic acids.

All baleful exhalations are, by ozone, immediately destroyed, and idio, or koino-miasmata rendered harmless. Ozone, in the minutest quantity, can always accomplish this; *it will always purify five hundred and forty times its volume of impure air.* Schönbein, from this striking fact, was disposed to think that chlorine was not an element, but a compound, consisting of chlorine and ozone; and that ozone was an element, from chlorine being regarded as a compound. Faraday has advocated the same views. These last statements are made on the authority of Dr. Griffin, of London.

Hydrogen, selenium, phosphorus, &c., when in small quantity pervading the air, render it unfit for respiration. From analogy, based upon this fact, ozone has been classed with these substances. Compounds of hydrogen are rapidly destroyed by ozone, and it is a significant fact that all miasm evolved by the decomposition of vegetable matter is in a great degree made up of this gas. Faraday considers that ozone is always present, when water exists in the form of vapor. Ozone is rapidly diffusive, and thus eminently adapted for use as a disinfectant. It is not known at what degree of heat ozone is decomposed; Dr. Gregory states, that if "the air of a jar, charged with ozone, be made to pass through a tube which is heated by a spirit lamp, the gas, as it flies from the tube, no longer affects the ozonoscope." It is decomposed by heat, and this peculiarity, with that of its great oxidizing power, prevents its injurious accumulation in the atmosphere. Were this not the case, it would soon destroy not only the dead, but living animals and plants. The pungent odor, given off during the decomposition of water by the electric current, is due to the union of a minute quantity of ozone with the oxygen formed.

Ozone is most abundant in winter, and usually so in the morning. At such periods there is no heat to decompose, or noxious exhalations to consume it. Ozone oxidizes nitrogen, forming perhaps the protoxide of nitrogen; sea-air is fully charged with ozone. The exhilarating effect of morning and sea-air may be due to the presence of the protoxide of nitrogen thus formed. Its oxidizing nitrogen is most beautifully seen in the increased green of vegetation after a thunder storm. As early as 1785, Cavendish discovered that a succession of electric sparks, passed through atmospheric air, generated nitric acid; that the acid thus formed united with ammonia, and was in the rain-drop precipitated upon the earth. Guy-Lussac has confirmed this view. The increased green of vegetation, under the influences thus mentioned, is always beautifully apparent. Atmospheric air, being thus subjected to electrical influences, generates ozone; ozone unites with the nitrogen of the atmospheric air and produces nitric acid; the nitric acid, in turn, unites with ammonia, and, as the nitrate of ammonia, descends in the rain upon the soil, nourishing and beautifying its vegetation. This makes perfectly intelligible the phenomena mentioned by Cavendish. The nitric acid, we thus see, is not formed, as was mentioned by Cavendish, by the action of the electric fluid upon the *nitrogen* of the air, but upon its *oxygen* in the presence of water, or watery vapor; *and that ozone being thus formed, it next reacts upon the nitrogen,* thus producing the results mentioned. It is ozone and not electricity which forms this nitric acid, and we have, in this, the explanation of the presence, in the rain-drop, of the fertilizing nitrate of ammonia. Ozonized atmospheric air, with lime water, produces nitrate of lime. When ozone has lost its oxidizing power, as caused by the iodide of potassium, it resumes its chemical activity, when submitted, *in a damp condition,* to the action of the electric spark. This gives us a very simple, yet true, explanation of the extreme purity of the atmosphere after a summer's storm.

Ozone unites, without decomposition, with olefiant gas. It destroys sulphuretted and seleniuretted hydrogen. Sulphurous and nitrous acids are, by it, changed into sulphuric and nitric acids. Although it is not known at what degree of heat ozone commences to be decomposed, it is known that at 268° F. it is entirely destroyed. At ordinary temperatures, charcoal decomposes it. Ozone decomposes the salts of protoxide of manganese and a solution of the ferrocyanuret of potassium. The sulphate of manganese becomes brown when subjected to an ozonized atmosphere. The sulphide of lead becomes white, and "the dilute solution of the blue sulphate of indigo is bleached" under the same influences. Silver foil, in a few hours, crumbles to dust, and is converted into a peroxide of silver when exposed to ozone in a pure and undiluted condition. Tincture of guaiacum is turned blue by its influences. The sulphurets of iron, lead, copper and antimony are converted by ozone into sulphates. It gives to the atmosphere chemically peculiar properties, and the bleaching effect of sunlight is solely due to it. The decay, diseases and deaths of animals and plants destroy ozone; the ammoniacal and sulphur gases of the atmosphere are oxidized by it and converted into salts. Ozone is absorbed by animal and vegetable substances; by albumen, casein and fibrin; by blood; by animal and vegetable miasmata. In this process, these substances are oxidized and destroyed. Ozone is thus the great purifier of the atmosphere. Many years ago, the eminent Graham made an assertion upon this subject, which (then discredited) is now fully acknowledged. After giving the views of Brewster, Ure and Davy; of Prout, Daniell, De Saussure and Hutton; of Priestley, Danbery, Boussingault and other well known writers upon this subject, he declared "that, of the compound volatile bodies of the atmosphere, few can long escape *oxidation;* the atmosphere contains, within itself, the *means* of its own purification."

These are the principal and most interesting chemical properties of ozone; we postpone, for a time, its actions and agencies, and pass on to the consideration of its artificial formation and its great sources in nature.

It is easily formed, through the chemical actions and reactions of phosphorus. Dr. Griffin has simplified this process, and we prefer to quote his method, as given by himself:—"Take a piece of phosphorus about half an inch long; clean its surface by scraping; put it into a clean two-quart glass bottle; add as much water as covers the phosphorus half way; close the bottle with a loose stopper and set it aside, at a temperature of about 60° F. Ozone will soon begin to form in the air of the bottle, and, in five or six hours, it will be abundant. Remove the phosphorus, shake a little water in the bottle, and throw that out to remove the phosphoric acid. Repeat this washing several times. The ozone is not washed away, but remains in the air of the bottle." This is a favorite way of forming ozone in the laboratory; it is convenient, and very simple. The oil of turpentine, acted upon by the air of the vessel containing it, generates ozone, provided the vessel be subjected to the effect of the sun's light. The chemical agencies of magnetism and galvanism evolve ozone. A current of electricity, passing across the surface of water, produces it.

It should have been stated, in the method of forming ozone by phosphorus, that the air in the vessel should be of average barometrical pressure, and the temperature not under 50° F. or over 96° F. Ozone is not thus formed at zero; the formation beginning at 46° F., and becoming rapid at 75° F. Ozone is formed by an electrical machine, when in rapid motion; it is detected by its odor. It is said to be particularly evident near Ruhmkorff's induction coil. During the electrolysis of water, and under the presence of particular acids, ozone is always formed. The mixed gases thus produced always manifest the presence of ozone.

M. Le Roux states, that ozone is formed by heating platinum wire to incandescence, by the electric current. Ozone may easily be formed with a little ether and a spirit lamp. Pour a few drachms of ether into a large bottle and shake the whole, that an abundant atmosphere of ether may be formed. Into this atmosphere, thus formed, plunge a glass rod (or platinum wire) heated moderately, and ozone is immediately formed. If the rod or wire be too much heated, ozone is destroyed as rapidly as it is formed. The most beautiful method of forming ozone is that mentioned when treating of the composition of ozone; placing a tube, filled with oxygen, over a solution of the iodide of potassium and water. When oxygen is electrified, by means of platinum wires in connection with an electric machine, it is, in the presence of this solution, converted into ozone. An ozonoscope, placed in the top of the glass tube, will prove this. The ozone thus formed attacks the potassium of the solution, and this, in its conversion into potassa, liberates the iodine associated with it; the iodine unites with the water, tinging it of a deep yellow; the ozone, being thus consumed, the solution (now deeply colored) rises to fill the vacuum formed and the surface of the water is depressed in the fountain. The measure of this depression represents the capacity of the tubes used. The method of forming ozone by electrifying pure dry oxygen, is now doubted, and cannot be here mentioned as a means now recognized. When ozone is formed by the decomposition of water by the galvanic pile, it is always manifested at the positive pole. Scoutetten observes, that when phosphorus is plunged into a damp mixture, consisting of four parts of hydrogen and one of oxygen, ozone is generated with such rapidity that the phosphorus takes fire and the mixture explodes. Dr. Richardson, in common with many others, uses, in his experiments on the subject of ozone, the peroxide of hydrogen, formed by the action of pure hydrochloric acid on the peroxide of barium.

On account of the extreme interest created by Dr. Richardson's experiments, and from the general attention bestowed upon his researches in regard to this subject, we shall give, in detail, his method of forming the peroxide of hydrogen, or ozone. As one of the chief impediments to the therapeutic use of the peroxide of hydrogen has been its difficult and complex preparation, and as Dr. Richardson has very much simplified this, the following description will possess a value which those engaged in the study of ozone will best know how to appreciate.

"Make, first, peroxide of barium, by heating in an iron or platinum cup, at a dull red heat, *pure baryta.* When the baryta is at a red heat, sprinkle over it dry pulverized chlorate of potassa, adding slowly about half as much of the chlorate as you have taken of baryta. After the chlorate has yielded all its oxygen to the baryta. withdraw the heat, and when the mass has cooled, put it into a closed bottle with distilled water, and wash well to remove the chloride of potassium. Be very cautious not to expose the peroxide of barium, thus formed, to the air; if you do, it will take up carbonic acid and fail afterwards. After thorough washing, decant the water and dry the peroxide slowly in a closed air furnace. The peroxide of barium, on drying, will be ready for use, and it should be used quickly. Next take twenty ounces of distilled water and add to it two fluid drachms and twenty minims of pure hydrochloric acid; then take two drachms and ten grains of the peroxide of barium; powder this in a glass mortar, and add to it a little water, to make it into a paste. Now add this paste, little by little, to the acid and water, stirring constantly. The paste will all dissolve up. The paste being now in solution, add slowly one drachm and a half of dilute sulphuric acid (one part of acid to two of water), and for a short time stir. On ceasing agitation, there will be a fine precipitate of sulphate of baryta; when this sulphate has subsided, filter the supernatant liquor. You have now made a solution containing one volume of the peroxide of hydrogen, with the hydrochloric acid with which you started free in the solution also. Once more, add to the solution the same quantity of the peroxide of barium and the same quantity of sulphuric acid; filter and repeat the process again and again, until you have charged, to ten volumes of peroxide of hydrogen, the solution in use. To remove the hydrochloric acid ultimately, add, to your last solution, pure sulphate of silver; this will throw down chloride of silver and leave sulphuric acid (SO^3) in solution. Filter and carefully neutralize with the hydrate of baryta. The process is now complete."—(Autograph letter of Dr. B. W. Richardson, Jan., 1861.)

This remarkable substance was first discovered by Thénard in 1818, but the complex mode of its preparation and its unknown therapeutical, or physiological value, has served to keep it in almost total obscurity. We postpone its remarkable properties, until these form the chief subject of consideration.

We come now to consider an important branch of our subject—the natural and extensive sources of ozone. Amid a desultory enumeration of the artificial sources of this substance, was mentioned the well-tested fact, that a current of electricity, passing across the surface of water, generated ozone. This simple discovery, as trivial as it appears, is not only interesting, but important in a scientific point of view. What is it that gives polarity to the magnetic needle, but that vast electrical belt which encircles the globe? This belt, though ever changing, is as clearly demonstrable as the most elementary truth in science. It was successful labor in this field that rendered enduring the reputation of Brewster, of Becquerel and others; and science, at least, never confers an honor unless the votary be worthy of the gift. The magnetic meridian is one of the great truths of chemical philosophy. We are forced to believe, *that a prime effect of this subtle fluid, in its magic circle, is, from the expanse of water which it spans, to elaborate this new and powerful agent;* an agent bringing purity to an atmosphere which would, otherwise, soon contain within itself the seeds of inevitable death. This, one of the chief natural sources of ozone, has not, we believe, ever been suggested, and it is now offered for analysis and approval.

Ozone is generated on a stupendous scale by the electrization of oxygen which escapes from all bodies of water. Varied and beautiful experiments demonstrate the truth of this. We will mention a few of the most important. Water being placed in an earthen-ware vessel (varnished), supported on a tripod of three glass bottles (to counteract the effect of terrestrial electricity), and covered with a glass receiver, generates ozone in very full and decided quantity. This glass bell receiver has attached, to the top of its inner surface, an ordinary ozonoscope. The experiment should last twenty-four hours, and at the close of it the ozonoscope usually registers 7 or 8 of the ozonometric scale; 10 representing the maximum quantity of ozone existing in the atmosphere. It will be observed that ozone is thus largely generated. This experiment has been made with river, rain and spring water; the result being the same. Experiments have proved that ozone is, in this manner, always formed. It is in this particular way formed most largely during those hours of the day which represent the maximum of evaporation; influenced, of course, by the temperature of the day, the agencies of the sun and the clearness of the sky. It is important to know if this oxygen, going to form ozone, proceeds from the decomposition of water by evaporation, or if it is furnished from the atmospheric air contained in the water.

[To be continued.]

Reports of Medical Societies.

EXTRACTS FROM THE RECORDS OF THE BOSTON SOCIETY FOR MEDICAL IMPROVEMENT. BY FRANCIS MINOT, M.D., SECRETARY.

AUGUST 22d.—*Catalepsy.*—Dr. C. E. WARE reported the following case.

The patient was a rather feeble-minded woman, 19 years of age, who was confined April 18th, 1864, with her first child, illegitimate. Except that she had been somewhat desponding, there had been nothing unnatural about her up to this time. Her labor was not severe nor protracted. Her physician saw her for a week after her confinement. He noticed nothing peculiar about her, except her general sadness and unwillingness to converse. She nursed her child, but took little interest in it. She paid little heed to herself, neglecting even the common calls of nature. Owing to the difficulty of getting at any of the sources of information previous to her entrance into the Mass. Gen. Hospital, it is impossible to fix the date of the commencement of the catalepsy. According to the statement of another patient in the hospital, who came from the same town, and who heard of the facts at the time, she became suddenly cataleptic on being told that her lover had deserted her. From the best evidence to be obtained, it occurred a week or two after her confinement.

She entered the hospital May 10th. She was brought there by the police, who found her in a lager beer saloon, where she had been left by the man who brought her to the city, as he said, to obtain medical advice for her. She was a well-developed person, of fair complexion, somewhat anæmic, and marked by acne.

When first seen by Dr. Ware, she was in bed, on her back. Her expression fixed. Her eyes open and rolling, with pupils moderately dilated. There was a slight tremulousness of the muscles about the mouth. Skin moist. Respiration perfectly normal. Pulse 108, good in character. When asked to protrude her tongue, she made an apparent effort to do so. Nothing abnormal was discovered about the abdomen; no tenderness. The right foot and ankle were slightly œdematous. When either of her arms was placed in any position, no matter how fatiguing or difficult to maintain, it remained so until it was moved by some one else. Sometimes when her arm was raised, if asked to do so, she would slowly let it fall, but generally she paid no heed to such suggestions. On one occasion both arms were held up an hour, and then were put down by the nurse. When raised upon her feet, she balanced herself, and remained fixed like a statue; but when gently pushed or dragged forward till she was near losing her balance, she would put forward a foot to save herself, and could thus be made to walk. This was the only voluntary movement that she made, excepting the occasional dropping of her arms, and that sometimes in the night she was observed to attempt to turn in bed. There was also once or twice a gurgling sound in her throat, as if from an attempt to speak. There was no sensitiveness to pinching, although there was a little to tickling of the feet; and once when her feet were tickled by the nurse, she burst into loud laughter. She slept well, and often heavily through the night, with her eyes closed. Food was forced through her teeth, when she swallowed it. Sometimes there was drooling from her mouth (especially after taking food) of a fluid, of a sickish, offensive odor. Her urine was involuntary. Her discharges were obtained by injections, or physic.

May 16th, she was etherized to stertor, but not to entire relaxation of the muscular system. Her pulse went up to 120, became quite feeble, and there was great lividity. As her arm fell at this point, the etherization was stopped; but up to this point the catalepsy was perfect, and it continued perfect for many minutes after all voluntary control of herself must have been lost. Immediately as the effect of the ether began to pass off, the cataleptic state returned, and was complete again long before, under ordinary circumstances, consciousness would have returned. There was no excitement following the ether, nor was the peculiar affection of the nervous system apparently modified by it in any way, except for the moment. An offensive vaginal discharge was observed soon after her entrance to the hospital. To the introduction of the speculum she paid no attention. The vagina was found intensely inflamed, and there was an extensive ragged-looking ulceration of the os uteri, with a copious purulent discharge from both. This was treated with caustics and cold-water injections.

May 18th, she was exposed to a strong electro-magnetic battery, applied to her arms and hands when they were raised in the air. It produced violent twitching of the muscles, but no arrest of the cataleptic state.

She continued in this state through May without any material change; some days the catalepsy being more perfect than others, but never leaving her entirely. Her pulse varied from 96 to 120, being generally higher in the after part of the day. Her tongue could never be seen. Liquid food was forced through her teeth, which she swallowed without difficulty.

May 21st, the vagina had quite a healthy appearance, and the ulcer on the os uteri was healing.

May 30th, she was observed to turn over frequently in the night in bed, although her condition in the day was essentially the same as before.

June 8th, the catalepsy was less perfect. She would move voluntarily when requested. She walked twelve feet and sat down in a chair without assistance. On the 11th, she walked round the room several times, and raised herself from her chair voluntarily. On the 14th, she spoke for the first time, and fed herself.

From this time she continued to improve, gradually recovering her natural condition mentally and physically. She was evidently a person of feeble understanding, but well disposed, and cheerful, occupying herself about anything required of her. She was easily guided by those about her, and much credit is due to Miss Stone, the nurse, for the kindly influence she exercised over her in encouraging her in shaking off the nervous spell which controlled her.

The cataleptic condition, according to the most reliable testimony, commenced some time towards the end of April. She could hardly be said to be free from it before the last of June. It probably existed, well characterized, six or seven weeks. She was well nourished by liquid food forced between her teeth. Her bowels were moved either by castor oil or injections. Except opiates, which were tried at the outset without marked effect, no medicine was administered.

The disease of the os uteri and vagina were treated by injections and caustic, and speedily improved. Indeed they had very greatly mended before there was any marked change in her cataleptic symptoms, and the latter had entirely disappeared before the ulcer on the os had entirely healed.

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON: THURSDAY, SEPTEMBER 22, 1864.

Difficulties of Medical Journalism in America at the present Time.—Our able weekly cotemporary, the *American Medical Times*, has, we regret to say, been compelled by the adverse circumstances of the present day to suspend publication. The Editors announce in their issue of the 3d inst. that the response on the part of their subscribers to the recent moderate increase of charge, made necessary by the enhanced and daily growing cost of publication, although liberal, has not been sufficient to warrant the continuance of their Journal at the present time. They yield with reluctance, and look forward with confidence to a resumption of the publication at some future day. Not having observed any symptoms of decadence in the *Times*, we must confess to some surprise at this announcement. It certainly is not creditable to the City and State of New York, that a journal of the high character of our suspended cotemporary should thus be allowed to pass into a state of inanition. It is hardly credible that the small tax of five dollars instead of three can have turned the scale against it in the estimate set upon it by the profession there; and we really feel it is worth an effort outside of the office of the *Times* to set the vital current in motion once more, even if it were only to show that the great value of a high-toned, scientific medical publication is properly appreciated in the commercial metropolis. Of the great importance of such a journal in our principal capitals to the vitality of our profession, no one can doubt for a moment; probably the interruption in the publication of the *Times* will make this fact more real to those who have been its readers than it was before its career received a check.

In Philadelphia, also, we observe that medical journalism is staggering under a heavy load of difficulties. The *Medical and Surgical Reporter*, after dropping behind a number of weeks in the date of its issue, finding itself unable by more rapid publication to fill up the number necessary to make its present issue correspond with the current date, has jumped over the hiatus, and appears with number and date of the present time, as if there had been no gap. The Editors promise at the end of the volume to make up the full measure of reading matter. We feel with regard to the *Reporter* pretty much as we do with regard to the *Times*. We should hardly have supposed that a city which has so long been the principal seat of medical education in the land, and which is still the principal centre of medical publication, should so poorly sustain its weekly journal that it finds itself hard pushed to keep up with the march of time. Both Philadelphia and New York should sustain a weekly organ to represent the best part of the medical profession in those cities; and we sincerely hope our brethren will bestir themselves diligently to accomplish this.

As for ourselves, we would only say, in all modesty and thankfulness, that thus far we "hold our own." Of course we are subjected to similar trials to those which have embarrassed our cotemporaries, but as yet have been able to keep our heads above water, albeit not without some struggle and getting a little short in the wind. As the oldest weekly medical Journal in the country, we appeal to our friends to help us to work through the troubled waters which we are navigating at the present. Let us have not merely the needful pecuniary support, but those professional contributions which will show that the light of pure medical science still burns among us undimmed by the heavy clouds of national trial and adversity.

Comparative Success of Ovariotomy in the City and Country.—We are happy to publish the following communication from Dr. Kimball; none the less so, that it corrects an erroneous impression of ours. The successful cases of ovariotomy in this city we had not before heard of, and should be glad to have fuller particulars of them. We hope Dr. Kimball will be induced to publish the statistics of all his operations, as they cannot fail to be of great interest and value.

Messrs. Editors,—In the course of some remarks which appeared in the Journal of the 24th ult., upon the address of Dr. Warren, at the last meeting of the Mass. Medical Society, you have taken occasion to make allusion to my recently-published cases of ovariotomy; and in doing so, you have inadvertently given a wrong impression as to the result of this operation in city practice, stating that "you cannot recal a single instance of a fortunate termination of this operation in Boston."

During the several years I have been engaged in this particular line of surgery, I have operated in Boston four times. My first three cases terminated successfully; the fourth, and unsuccessful case, occurred last December, and an account of it has since been published.

The large proportion of favorable results, as shown in these instances, I am well aware, should be regarded as a mere coincidence, and by no means implying any superiority of skill on the part of the operator; considered, however, in reference to the question of advantage of *locality*, I find my city cases, so far as they go, furnish a larger proportion of recoveries than those in country towns.

After all, however, I suppose there can be little or no doubt, that as a general rule, patients submitting to ovariotomy or any other surgical operation of magnitude, stand a better chance of recovery in the country than in cities. I suppose, moreover, that it is a fact equally clear and well settled, that cases of *ovariotomy specially*, occurring in hospitals, are not as likely to terminate successfully, as those treated in private practice. G. Kimball.

Per contra to the above, an anonymous writer in the last number of the *American Medical Times*, who is strongly opposed to ovariotomy, sums up his opinions and statements as follows:—

"I may further urge in my own behalf, as well as that of my surgical brethren generally:—1st. That the diagnosis in a majority of cases of ovarian disease is very obscure, and that the prognosis is to the same extent doubtful, if not unfavorable. 2d. That many females carry these tumors through a long life with comparatively little inconvenience; that in many cases they actually diminish in size, while the inconveniences attending them often nearly disappear. 3d. That the most favorable statistics show that nothing is gained *on the whole* as regards the prolongation of life by the operation; for it is found that, taking an equal number of females affected with ovarian tumors of equal ages and under as nearly as possible similar circumstances, *the average duration of life will be greater in those on whom the operation has not been performed than in those who have submitted to it.* So that *statistics*, in fact, condemn the operation as unjustifiable. 4th. In all the other great operations the surgeon has no misgivings; he is laid, as it were, under *duress*, as Prof. Meigs would say, to operate if circumstances required, and he has no severe qualms of conscience should the case prove afterwards fatal. 5th. Far otherwise, however, must it be with every properly constituted mind when a fatal result attends an operation regarded as wholly unjustifiable by the highest authorities in surgery, and by nine tenths of the profession generally. 6th. From what has been offered, it may safely and justly be inferred that our principal surgeons do not envy the professional reputation acquired by the operation in question; they do themselves honor by showing that they have studied ethics in a wiser school, and that they prefer peace of mind and a good conscience to transient notoriety and pecuniary rewards."

Compression in Cephalalgia.—M. Guyon related, in a paper read at the Academy of Sciences, that during the epidemics of yellow fever which he witnessed in the West Indies, he was often in the habit of feeling the pulse at the temporal artery. One day, having compressed it with more than usual firmness, he found that the intense cephalalgia, which is an accompaniment to this affection, was greatly relieved; and further trials made by compressing both temporals were attended with complete disappearance of this symptom. It became then a question whether this fact could be turned to practical account, and whether it would be attended with any notable inconveniences. The headache in yellow fever constitutes so predominant a symptom that some practitioners have even resorted to scarifications and opening the temporal artery to obtain relief. Compression has, indeed, been used after a fashion by the native women, who, dividing a lemon in two, bind the halves on each temple by means of a bandage passed several times around the head. This cannot, however, be long continued without a certain amount of irritation of the skin being induced; but there can be no doubt that the pain is relieved or removed in this way as long as the pressure is continued. Moreover, as well as under a more effectual mode of compression, not only is the pain relieved, but the patient comes out of his state of torpor or somnolence, breathes freely, and replies cheerfully to questions addressed to him. The best mode of exercising compression is by a semicircular curved band of steel, provided at each end with a pad resembling that of a hernia truss, and which is movable, so that the compression need not always be made precisely on the same spots. Enough space should be left between the steel arch and the forehead to admit of the cold applications being made to the latter which are found so useful in yellow fever. M. Guyon feels certain that compression will also be found of the same utility in the cephalalgia of other forms of fever.—*Medical Times and Gazette.*

M. **Decaisne**, in a communication to the *Academie des Sciences*, exhibits another clause in the heavy bill of indictment against the abuse of tobacco. He states that in the course of three years he has met, among eighty-three inveterate smokers, twenty-one instances of marked intermittence of the pulse, occurring in men from 27 to 42 years of age, and not to be explained by organic lesion of the heart. The absence of such lesion or other condition of health capable of inducing intermission of the action of the heart, and the fact that in nine of these instances, in which the use of tobacco was abandoned, the normal action of the organ was restored, M. Decaisne believes, will justify him in concluding that, in certain subjects, the abuse of tobacco may give rise to a condition which may be termed "narcotism of the heart," characterized by intermission in the movements of that organ and in the pulsations of the radial artery; and that, in some cases, a suspension or diminution in the practice of smoking is sufficient to cause an entire disappearance of this irregularity.—*Ibid.*

At a late meeting of the Cincinnati Academy of Medicine, Dr. Blackman presented an extraordinary specimen of osteo-sarcoma, or enchondromatous tumor of the femur, measuring four feet in circumference and weighing sixty-five pounds.

At the late annual meeting of the Am. Dental Association at Niagara, resolutions were passed, awarding to Dr. Horace Wells of Hartford, the credit of the introduction of anæsthesia in the United States, and protesting against the efforts made to bestow it upon others.

VITAL STATISTICS OF BOSTON.

For the Week ending Saturday, September 17th, 1864.

DEATHS.

	Males.	*Females.*	*Tota*
Deaths during the week - - - - - - - -	45	48	93
Ave. mortality of corresponding weeks for ten years, 1853—1863,	48.1	46.4	94.5
Average corrected to increased population - - - - -	00	00	103.9
Death of persons above 90 - - - - - - - -	0	0	0

Died,—At North Wilmington, Sept. 15th, Dr. Silas Brown, aged 84 years and 10 months.

Deaths in Boston for the week ending Saturday noon, Sept. 17th, 93. Males, 45—Females, 48.—Accident, 1—apoplexy, 3—inflammation of the bowels, 3—congestion of the brain, 2—disease of the brain, 2—inflammation of the brain, 1—bronchitis, 3—cancer, 1—cholera infantum, 14—cholera morbus, 2—consumption, 14—croup, 1—diarrhœa, 6—diphtheria, 1—dropsy of the brain, 8—dysentery, 10—scarlet fever, 3—disease of the heart, 1—hernia, 1—infantile disease, 3—insanity, 1—intemperance, 1—inflammation of the lungs, 3—marasmus, 3—rheumatism, 1—scrofula, 1—smallpox, 1—teething, 1—unknown, 2—whooping cough, 1.

Under 5 years of age, 52—between 5 and 20 years, 7—between 20 and 40 years, 17—between 40 and 60 years, 9—above 60 years, 8. Born in the United States, 66—Ireland, 21—other places, 6.